

Jobs are expected to be increasingly concentrated in larger companies as the number of smaller shops and family owned businesses declines. However, those repairers that maintain strong industry relationships may still go into business for themselves.

Employment is relatively steady because the demand for appliance repair services continues even during economic downturns. However, during economic slowdowns some repair shops may lay off repairers.

Earnings

Median annual earnings, including commission, of home appliance and power tool repairers were \$26,010 in 1998. The middle 50 percent earned between \$20,380 and \$34,790 a year. The lowest 10 percent earned less than \$15,730 and the highest 10 percent earned more than \$42,090 a year.

Earnings of home appliance and power tool repairers vary according to the skill level required to fix equipment, geographic location, and the type of equipment repaired. Because many repairers receive commission along with their salary, earnings increase along with the number of jobs a repairer can complete in a day.

Many larger dealers, manufacturers and service stores offer benefits such as health insurance coverage, sick leave, and retirement and pension programs. Some home appliance and power tool repairers belong to the International Brotherhood of Electrical Workers.

Related Occupations

Other workers who repair electrical and electronic equipment include heating, air-conditioning, and refrigeration mechanics; locksmiths; motorcycle, boat, and small-engine mechanics; office machine and cash register servicers; electronic home entertainment equipment repairers; and coin, vending, and amusement machine servicers and repairers.

Sources of Additional Information

For information about jobs in the home appliance and power tool repair field, contact local appliance repair shops, manufacturers, vocational trade schools, appliance dealers, and utility companies, or the local office of the State employment service.

For general information about the work of home appliance repairers, contact:

- ☛ Appliance Service News, P.O. Box 809, St. Charles, IL 60174.
- ☛ National Association of Service Dealers, 10 E. 22nd St., Suite 310, Lombard, IL 60148.
- ☛ United Servicers Association, Inc., P.O. Box 59707, Dallas, TX 75229.
- ☛ National Appliance Service Association, 9247 N. Meridian, Suite 216, Indianapolis, IN 46260.

For information on technician certification, as well as general information about the work of home appliance repairers, contact:

- ☛ National Appliance Service Technician Certification Program (NASTeC), 10 E. 22nd St., Suite 310, Lombard, IL 60148. Telephone (tollfree): 1-888-NASTeC1 (627-8321).

Internet: <http://www.nastecnet.org>

- ☛ Professional Service Association, 71 Columbia St., Cohoes, NY 12047.

Industrial Machinery Repairers

(O*NET 85112, 85113, 85116C, 85118, 85119A, 85119B, 85128A, and 85128B)

Significant Points

- Workers learn their trade through a 4-year apprenticeship program or informal on-the-job training supplemented by classroom instruction.
- While employment of industrial machinery repairers is projected to grow more slowly than average, applicants with broad skills in machine repair should have favorable job prospects.

Nature of the Work

When production workers encounter problems with the machines they operate, they call industrial machinery repairers. These workers, also called industrial machinery mechanics or maintenance machinists, maintain and repair machinery in a plant or factory. Their work is important not only because an idle machine will delay production, but also because a machine that is not properly repaired and maintained may damage the final product or injure the operator.

Maintenance mechanics must be able to detect and diagnose minor problems and correct them before they become major ones. For example, after hearing a vibration from a machine, the mechanic must decide whether it is due to worn belts, weak motor bearings, or some other problem. Computerized maintenance, vibration analysis techniques, and self-diagnostic systems are making this task easier. Self-diagnostic features on new industrial machinery can determine the cause of a malfunction and, in some cases, alert the mechanic to potential trouble spots before symptoms develop.

After diagnosing the problem, the mechanic disassembles the equipment and repairs or replaces the necessary parts. Once reassembled, the final step is to test the machine to ensure it is running smoothly. When repairing electronically controlled machinery, maintenance mechanics may work closely with electronic repairers or electricians who maintain the machine's electronic parts. However, industrial machinery repairers increasingly need electronic and computer skills to repair sophisticated equipment on their own. (Statements on electronic repairers, commercial and industrial equipment, as well as electricians, appear elsewhere in the *Handbook*.)

Although repairing machines is the most important job of industrial machinery repairers, they also perform preventive maintenance. This includes keeping machines and their parts well oiled, greased, and cleaned. Repairers regularly inspect machinery and check performance. For example, they adjust and calibrate automated manufacturing equipment such as industrial robots, and rebuild components of other industrial machinery. By keeping complete and up-to-date records, mechanics try to anticipate trouble and service equipment before factory production is interrupted.

A wide range of tools may be used when performing repairs or preventive maintenance. Repairers may use a screwdriver and wrench to adjust a motor, or a hoist to lift a printing press off the ground. When replacements for broken or defective parts are not readily available, or when a machine must be quickly returned to production, repairers may sketch a part that can be fabricated by the plant's machine shop. Repairers use catalogs to order replacement parts and often follow blueprints and engineering specifications to maintain and fix equipment.



Industrial machinery repairers maintain and repair machinery in plants or factories.

Installation of new machinery is another responsibility of industrial machinery repairers. As plants retool and invest in new equipment, they increasingly rely on these workers to properly situate and install the machinery. In many plants, this has traditionally been the job of millwrights. (See the statement on millwrights elsewhere in the *Handbook*.) As employers increasingly seek workers who have a variety of skills, industrial machinery repairers are taking on new responsibilities.

Working Conditions

Working conditions for repairers who work in manufacturing are similar to those of production workers. These workers are subject to common shop injuries such as cuts and bruises, and use protective equipment such as hard hats, protective glasses, and safety belts. Industrial machinery repairers may also face additional hazards because they often work on top of a ladder or underneath or above large machinery in cramped conditions.

Because factories and other facilities cannot afford breakdowns of industrial machinery, repairers may be called to the plant at night or on weekends for emergency repairs. Overtime is common among industrial machinery repairers—more than a third work over 40 hours a week.

Employment

Industrial machinery repairers held about 535,000 jobs in 1998. About 7 of every 10 worked in manufacturing industries, primarily food processing, textile mill products, chemicals, fabricated metal products, and primary metals. Others worked for government agencies, public utilities, mining companies, and other establishments in which industrial machinery is used.

Industrial machinery repairers work in a wide variety of plants and are employed in every part of the country. However, employment is concentrated in heavily industrialized areas.

Training, Other Qualifications, and Advancement

Many industrial machinery repairers learn their trade through a 4-year apprenticeship program combining classroom instruction with on-the-job-training. These programs are usually sponsored by a local trade union. Other workers start as helpers and pick up the skills of the trade informally and by taking courses offered by machinery manufacturers and community colleges.

Repairers learn from experienced repairers how to operate, disassemble, repair, and assemble machinery. Classroom instruction focuses on subjects such as shop mathematics, blueprint reading, welding, electronics, and computer training.

Most employers prefer to hire those who have completed high school. High school courses in mechanical drawing, mathematics, blueprint reading, physics, computers, and electronics are especially useful.

Mechanical aptitude and manual dexterity are important characteristics for workers in this trade. Good physical conditioning and agility are also necessary because repairers sometimes have to lift heavy objects or climb to reach equipment located high above the floor.

Opportunities for advancement are limited. Industrial machinery repairers advance either by working with more complicated equipment or by becoming supervisors. The most highly skilled repairers can be promoted to master mechanic or can become machinists or tool and die makers.

Job Outlook

Employment of industrial machinery repairers is projected to grow more slowly than the average for all occupations through 2008. Nevertheless, applicants with broad skills in machine repair should have favorable job prospects. As more firms introduce automated production equipment, industrial machinery mechanics will be needed to ensure these machines are properly maintained and consistently in operation. However, many new machines are capable of self-diagnosis, increasing their reliability and, thus, reducing the need for repairers. As a result, most job openings will stem from the need to replace repairers who transfer to other occupations or leave the labor force.

Unlike many other manufacturing occupations, industrial machinery repairers are not usually affected by seasonal changes in production. During slack periods, when some plant workers are laid off, repairers often are retained to do major overhaul jobs. Although these workers may face layoff or a reduced workweek when economic conditions are particularly severe, they usually are less affected than other workers because machines have to be maintained regardless of production level.

Earnings

Median hourly earnings of industrial machinery repairers were \$15.31 in 1998. The middle 50 percent earned between \$12.20 and \$19.02. The lowest 10 percent earned less than \$10.11 and the highest 10 percent earned more than \$22.97.

Earnings vary by industry and geographic region. Median hourly earnings in the industries employing the largest numbers of industrial machinery repairers in 1997 are shown below:

Motor vehicles and equipment	\$19.80
Metal forgings and stampings	17.70
Blast furnace and basic steel products	17.20
Electronic components and accessories	15.90
Machinery, equipment, and supplies	14.30
Miscellaneous plastics products, not elsewhere classified	14.10
Preserved fruits and vegetables	14.00
Hospitals	12.90
Meat products	12.00

Over 25 percent of industrial machinery mechanics are union members. Labor unions that represent industrial machinery repairers include the United Steelworkers of America; the United Automobile, Aerospace and Agricultural Implement Workers of America; the International Association of Machinists and Aerospace Workers; and the International Union of Electronic, Electrical, Salaried, Machine, and Furniture Workers.

Related Occupations

Other occupations that involve repairing machinery include aircraft mechanics and service technicians; elevator installers and repairers; machinists; millwrights; and automotive, motorcycle, diesel, farm equipment, general maintenance, mobile heavy equipment, and heating, air-conditioning, and refrigeration mechanics.

Sources of Additional Information

Information about employment and apprenticeship opportunities for industrial machinery repairers may be obtained from local offices of the State employment service or from:

- ✦ United Brotherhood of Carpenters and Joiners of America, 101 Constitution Ave. NW., Washington, DC 20001.
- ✦ The National Tooling and Machining Association, 9300 Livingston Rd., Fort Washington, MD 20744. Internet: <http://www.ntma.org>
- ✦ Precision Machined Products Association, 6700 West Snowville Rd., Brecksville, OH 44141. Internet: <http://www.pmpa.org>

Line Installers and Repairers

(O*NET 85702 and 85723)

Significant Points

- Line installer and repairer jobs require a high school diploma and, with experience, provide relatively high earnings.
- Employment is expected to grow due to the expansion of telecommunications networks.
- Line installers and repairers work outdoors under a variety of weather conditions.